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ABSTRACT

The report briefly describes a project whose purpose was to provide guidance and training for rural volunteer fire chiefs and firefighters in Wisconsin to increase the knowledge and skills they use to protect lives and property. The training was provided by part-time instructors who taught and demonstrated the courses and curriculum to suit the particular departmental and community needs; the problem of efficient fire protection in small rural communities is aggravated by the growth of small industrial plants, unplanned residential expansion, institutional rest and nursing homes, and compounded by regulations sometimes foreign to the situation. The program was administered by the State's vocational, technical, and adult education districts. During the program's initial year, 858 students were enrolled in a total of 25 courses. Enrollment data, forms, and letters are appended to the report; the bulk of the document, however, is comprised of selected materials provided to course instructors, including examination papers; recommended instructor course contents; a memo on course format and lesson planning; five detailed lesson plans; learning materials on portable fire extinguishers, silage gas, fires and silos, suspicious fires, and masks; the table of contents of an outline for institutional disaster planning and emergency procedure; and an instruction evaluation form. (AJ)

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REPORT OF FEDERAL PROJECT

02-034-151-313

DEVELOPMENT AND EVALUATION OF CURRICULUM AND MEDIA TO TRAIN PART-TIME FIRE SERVICE INSTRUCTORS IN RURAL AREAS

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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PREPARED BY

FRANK E. KLOSS

WESTERN WISCONSIN VOCATIONAL, TECHNICAL AND ADULT EDUCATION DISTRICT

CHARLES G. RICHARDSON, DISTRICT DIRECTOR

CE004611

JUL 07 1975

DEVELOPMENT AND EVALUATION OF CURRICULUM AND MEDIA

TO TRAIN PART-TIME FIRE SERVICE INSTRUCTORS IN RURAL AREAS

Implementation of the project as of August 5, 1972 provides the following data: Sixty-eight of 106 volunteer fire chiefs have been contacted in the parts of, or all of, the 13 counties that make up Western Wisconsin Vocational, Technical and Adult Education District and Southwest Wisconsin Vocational, Technical and Adult Education District.

The time spent contacting chiefs of these areas showed that the best equipment properly located cannot be utilized effectively without well-trained fire fighters. While some rural volunteers get excellent training, there are many who do not. It is therefore imperative to continue the program.

I. Introduction

A. Statement of Problem.

The complexities of change and growth have caused a phenomenal and difficult problem of efficient fire protection in the small communities and urban areas that make up 13 counties of southwest Wisconsin. This area is served by Western Wisconsin Vocational, Technical and Adult Education District and Southwest Wisconsin Vocational, Technical and Adult Education District. The problem is aggravated by the growth in these areas of small, industrial plants, unplanned residential expansion, institutional rest and nursing homes, and compounded by federal and state regulations, sometimes foreign to the situation, and difficult to enforce. The situation is further complicated by lack of qualified people available for the fire service, older persons on the volunteer fire department and desperately needed new equipment delayed by limited funds for purchase.

B. Significance of the Problem.

Problems become significant in volunteer fire departments, when, equipped with old and worn equipment, minimal community support, and limited funds, additional fire problems multiply in the community. Community-minded individuals, with limited knowledge and skills, serve as chiefs, along with members of the department. They are called upon to provide protection to large areas and special hazard occupancies, without full realization of the extent to which they are involved and liable.

C. Purpose.

The purpose of this project was to provide guidance and training for chiefs and members to increase the knowledge and skills they use to protect lives and property. The training was provided by part-time instructors who taught and demonstrated the courses and curriculum they prepared to suit the particular departmental and community needs.

D. Definitions.

A volunteer fire fighter is a man or woman who offers his or her services whenever possible to help prevent, control or extinguish fire or other emergencies in the community. Only limited remunerations for their time and effort is given.

A chief is a member of the volunteer department, usually elected by a majority vote of the membership. In some instances chiefs are appointed by the head of a municipality or by a Board of Police and Fire Commissioners, if such a group has been formed as indicated by 62.13 of Wisconsin State Statutes.

II. Methodology

A. Procedures Used.

First attempts to contact all chiefs in the district were made by letter identifying the program and explaining its objectives. A return addressed postcard was enclosed to provide an updated index of departments and the names of current chiefs, plus providing this office an idea of the needs.

The second step was to contact individual department heads and community officials, speak to them on a personal basis and arrange additional interviews concerning the problems and needs of the department and desired training. A structured interview provided follow-up information for this office to determine what curriculum or visual aids were best suited to their needs.

B. Materials.

Basic course outlines were furnished by the State Board Office under direction of Gordon Christianson, Consultant to the State Board

of Vocational, Technical and Adult Education. All courses for training of Volunteer Departments are requested by the chief of the department and implemented in cooperation with the chief.

C. Monthly Reports.

Monthly reports were filed with the school administration to prepare quarterly reports, semi-annual reports and annual reports needed for final determination as to the value of this project. Presently, quarterly reports and an annual project report are filed with the State Vocational, Technical and Adult Education Board at Madison. A copy of the annual report is attached in the appended items and gives data concerning classes conducted.

III. Findings

A. Instructors.

The problem of recruitment of qualified part-time instructors has slowed the program somewhat. Apparently the time and travel needs deter qualified persons from teaching in this profession. A total of 13 qualified persons were originally identified and certified to attend instructional sessions for training. At this particular time, only nine are available and some of these only on a limited basis. All qualified and interested instructors were given training by State Board personnel, teachers of the two participating district schools, and some additional time was spent with university teachers. Classes

were held and training in the use of the audiovisual equipment and instructional media were provided so that it could be utilized efficiently by these men. Interested instructors were given an opportunity to attend conferences, officer training classes and seminars to improve their ability. A standard form to rate instructor effectiveness was provided all students.

B. The Program.

It is apparent that this educational effort provides an incentive for volunteer firemen to continue participation in their respective communities. With many competing activities, it is not unusual to lose dedicated persons to other ways of personal enjoyment. It would be difficult to estimate the cost to the taxpayer, if in the two southwest districts of Wisconsin covering all of, or part of 13 counties, the 106 volunteer fire departments with approximately 2,500 members would disband or become inactive. No one can estimate the number of lives, jobs and millions of dollars worth of property saved by their endeavors. It is imperative, therefore, that this program be continued and that the money spent for it is well used.

C. Procedures.

It was determined that correct assessment of the problems of the various volunteer departments in the area could be had only by going to the most knowledgeable people involved in the community.

This was done and it should be noted that many of the contacts made were made by requests when chiefs and city officials learned that this program was available. Requests from departments with pertinent problems and difficulties consumed so great a portion of time that the general survey of district needs has not been completed.

D. Recommendations.

Continuation of this program is imperative in the light of the report of the President's Commission on Fire Prevention and Control. It is agreed that the most significant factor contributing to the cause and spread of fire is human failure. This need can best be corrected by educational effort. What better way to advance than to enlist the aid of these volunteer firefighters to help prevent, as well as control and extinguish fire. This program is adaptable, flexible and available to specifically pinpoint problem areas.

E. Addendum.

Enclosures

VE-FT-9

WISCONSIN BOARD OF VOCATIONAL, TECHNICAL AND ADULT EDUCATION

Eugene Lehrmann, Director

FIRE SERVICE TRAINING REPORT

For the period July 1, 1972 thru September 30, 19___
October 1, 19___ thru December 31, 19___
January 1, 19___ thru March 31, 19___
April 1, 19___ thru June 30, 1973

This report may be submitted quarterly or semi-annually:
Semi-annually to be submitted for July 1 thru December 31 and January 1 thru June 30.

Total students enrolled in Firemanship I	93
Total students enrolled in Firemanship II *	24
Total students enrolled in Fire Officer Courses	34
Total students enrolled in Institutional Fire Safety	
Total students enrolled in Industrial Fire Safety	98
Total students enrolled in Fire Science Associate Degre Courses	13
Attendance at Short Courses - Bldg. Burning	83
Attendance at Special School (Less than 3 hrs.)#	303
Attendance at Regional Schools (3 hrs. - 10 hrs.) #	185
Attendance at State-wide Fire Schools (more than 10 hrs.) #	
No. of courses completed at date of report	25
Total students enrolled in these courses	858
No. of Firemanship I Courses conducted	5
No. of Firemanship II Courses conducted	1
No. of Fire Officer Courses conducted	1
No. of Industrial Fire Safety Courses conducted	2
No. of Institutional Fire Safety Courses conducted	
No. of Special Schools conducted	11
No. of Regional Schools conducted	3
No. of State-wide Schools conducted	
No. of Bldg. Burnings conducted	4

Please list locations (community or school), type of training provided, and enrollment for all fire service training activities in your district on the attached sheet.

Upon completing this report please send to:

Gordon R. Christianson
Consultant - Fire Service
Wisconsin Board of Vocational, Technical and Adult Education
4802 Sheboygan Avenue - 7th Floor
Madison, Wisconsin 53702

* Firemanship II courses would include structured courses teaching selected firemanship skills in greater depth than in Firemanship I

\# These schools are usually of an association meeting, seminar or conference format and would not fit in the other classifications. The hours listed are only the amount [illegible]

LOCATION OF COURSES AND SCHOOLS

LOCATION	TYPE	ENROLLMENT
Stoddard	Firemanship I	18
Galesville	Firemanship I	25
Melrose	Firemanship I	26
Hillsboro	Firemanship I	12
Millston	Firemanship I	12
Stoddard	Firemanship II	24
La Crosse	Fire Officer	34
Camp McCoy	Industrial Fire Safety	76
La Crosse	Industrial Fire Safety	22
Tomah	Building Burned	25
Oakdale	Building Burned	14
Viroqua	Building Burned	19
Galesville	Building Burned	25
New Lisbon	Regional Schools	91
Elroy	Regional Schools	47
Trempealeau	Regional Schools	47
SPECIAL SCHOOLS:		
Sparta	Farm Fire Safety	24
Brookwood High	Farm Fire Safety	110
Warrens	Liquified Petroleum Gas	17
Sparta Fire Dept.	Ventilation	17
Viroqua	Masks	19
Ferryville	Masks	12
Ettrick	Masks	15
Holmen	First Aid - Multi-Media	21
Galesville	First Aid - Multi-Media	17
La Crosse	Basic Police Training - Suspicious Fires & Arson	51
La Crosse	Part-Time Instructor Training	7

Thirty-six (36) chiefs were contacted personally by Frank Kloss from August 5, 1972, through June 8, 1973.

VE-FT-9

WISCONSIN BOARD OF VOCATIONAL, TECHNICAL AND ADULT EDUCATION

Eugene Lehrmann, Director

FIRE SERVICE TRAINING REPORT

For the period Aug. 5 July 1, 19 72 thru June 30, September 30, 19 73
October 1, 19___ thru December 31, 19___
January 1, 19___ thru March 31, 19___
April 1, 19___ thru June 30, 19___

This report may be submitted quarterly or semi-annually:
Semi-annually to be submitted for July 1 thru December 31 and January 1 thru June 30.

Total students enrolled in Firemanship I	191
Total students enrolled in Firemanship II *	-
Total students enrolled in Fire Officer Courses	-
Total students enrolled in Institutional Fire Safety	54
Total students enrolled in Industrial Fire Safety	13
Total students enrolled in Fire Science Associate Degre Courses	-
Attendance at Short Courses - Bldg. Burning	-
Attendance at Special School (Less than 3 hrs.)#	-
Attendance at Regional Schools (3 hrs. - 10 hrs.) #	164
Attendance at State-wide Fire Schools (more than 10 hrs.) #	-
No. of courses completed at date of report	4
Total students enrolled in these courses	218
No. of Firemanship I Courses conducted	8
No. of Firemanship II Courses conducted	-
No. of Fire Officer Courses conducted	-
No. of Industrial Fire Safety Courses conducted	1
No. of Institutional Fire Safety Courses conducted	1
No. of Special Schools conducted	1
No. of Regional Schools conducted	-
No. of State-wide Schools conducted	-
No. of Bldg. Burnings conducted	-

Please list locations (community or school), type of training provided, and enrollment for all fire service training activities in your district on the attached sheet.

Upon completing this report please send to:

Gordon R. Christianson
Consultant - Fire Service
Wisconsin Board of Vocational, Technical and Adult Education
4802 Sheboygan Avenue - 7th Floor
Madison, Wisconsin 53702

* Firemanship II courses would include structured courses teaching selected firemanship skills in greater depth than in Firemanship I

\# These schools are usually of an association meeting, seminar or conference

LOCATION	TYPE	ENROLLMENT
Rewey	Basic Firemanship #1	17
Kieler	Basic Firemanship #1	18
Hillpoint	Basic Firemanship #1	21
Gays Mills	Basic Firemanship #1	35
Fennimore	Basic Firemanship #1	29
Boscobel	Basic Firemanship #1	25
Muscoda	Basic Firemanship #1	25
Argyle	Basic Firemanship #1	21
Glen Haven	First Aid Multi-Media	24
Fennimore	First Aid Multi-Media	12
Fennimore District #2	Rural Water Supplies Problems L. P. Gas	164
Fennimore	Part Time Instructors	7
Lancaster (Orchard Manor)	Institutional Fire Safety	54
Fennimore (Campus)	Industrial Fire Safety	13
Gays Mills	Radioactive Monitoring	36

32 Fire Chiefs contacted personally by Frank Kloss

WESTERN WISCONSIN TECHNICAL INSTITUTE

6th and Vine Streets
LA CROSSE, WISCONSIN
54601

CHARLES G. RICHARDSON
District Director

As you may or may not know, a new program has been made available through Western Wisconsin Technical Institute at La Crosse and Southwest Wisconsin Vocational-Technical School at Fennimore.

The position, "Teacher-Coordinator, Fire Service Specialist", has been filled and training programs and aid in other related "fire safety problems" are now available.

A group of qualified instructors is being trained to assist you with your fire safety problems.

A self-addressed postal card is enclosed for your convenience. If interested, return the card and you will be contacted in the near future.

Sincerely,

Frank E. Kloss
Teacher-Coordinator
Fire Service Specialist

FEK/mlu

Enclosure: Postal Card

S/FI/1

WESTERN WISCONSIN TECHNICAL INSTITUTE
Sixth and Vine Streets
La Crosse, Wisconsin 54601
Charles G. Richardson, District Director

AUTHORIZATION REQUEST

Mr. Frank E. Kloss
Coordinator-Teacher
Fire Service Training
Western Wisconsin Technical Institute
Sixth and Vine Streets
La Crosse, Wisconsin 54601

We would like to receive instruction in the _____ Course.

Name of Fire Department _____

Location _____

Signed _____

Title _____

Mailing Address _____

_____

Telephone No. _____

(Do not fill in below this line.)

AUTHORIZATION APPROVAL

Authorization to conduct _____

at _____. _____ sessions for a total of _____ hours.

Beginning Date _____ Ending Date _____

Mr. _____ is available as instructor. He will be paid

$_____ for the course. His travel allowance is estimated at $_____

and the total cost as $_____.

Recommended: _____
Coordinator-Teacher, Fire Service Training

Approved: _____
Administrator of Community Services

Date _____

VE-FT-22

WESTERN WISCONSIN TECHNICAL INSTITUTE

6th and Vine Streets
LA CROSSE, WISCONSIN
54601

CHARLES G. RICHARDSON
District Director

Dear Chief:

We are activating your request for _____.
Mr. _____ of _____
has been assigned as instructor for the course. He will be getting in touch with you soon to work out a schedule of classes that will be mutually agreeable and to meet with you and the officers of your department (and officials of your local government, if you care to invite them) for a planning session during which he can get acquainted with your department, its equipment, and the characteristics of the district you serve.

At this planning session, he will also answer questions you may have concerning the training.

We hope that the course will be both enjoyable and beneficial to your department and we shall appreciate hearing your comments about it and my suggestions you may care to make.

Sincerely,

Frank E. Kloss
Coordinator - Teacher
Fire Service Training
Districts 2 and 3

FEK:pac

2

VE-FT-33

WESTERN WISCONSIN TECHNICAL INSTITUTE

6th and Vine Streets
LA CROSSE, WISCONSIN
54601

CHARLES G. RICHARDSON
District Director

PLEASE RETURN THIS FORM AFTER FIRST PLANNING SESSION

To: Frank E. Kloss - Coordinator of Fire Service Training
Western Wisconsin Technical Institute
6th and Vine Streets
La Crosse, Wisconsin 54601

From: _____, Field Instructor

Subject: Basic Training Course

Fire Department: _____

Locality: _____

Number of Students: _____

Total Number of Members in Department: _____

Location of Classroom: _____

One Way Mileage from Instructor's Home to Classroom _____

Starting Hour: _____

Series "BA" Class Dates: _____ _____ _____

Series "F" Class Dates: _____ _____

Series "S" Class Dates: _____ S.1 _____ S.2 _____ S.3 _____ S.4

Series "SP" Class Dates: _____ SP 1A _____ SP 1B _____ SP 2A _____ Sp 2B _____ SP 3

Special Class Dates:* _____ _____ _____ _____ _____

*Special classes will include Institutional and Industrial Fire Safety Classes

Anything special or unusual on other side of this sheet.

2

INFORMATION FILE - VOLUNTEER FIRE DEPARTMENT

NAME

COMMUNITY

POPULATION

NUMBER OF MEMBERS

EQUIPMENT:

- Engines
- Tankers
- Ladder Trucks
- Rescue & Equipment Vehicle
- Ambulance

PROTECTION DISTRICT

NUMBER OF OFFICERS:

- Chiefs
- Assistant Chiefs
- Captains

PRESENT CHIEF:

- Name
- Address
- Phone: (Home) (Business)

SPECIFIC TRAINING NEEDS

MATERIALS PROVIDED INSTRUCTORS

The enclosed printed materials are some of the items that have been provided instructors. They are included to aid other schools in media development.

A. Courses Available

B. Examination Papers

C. Recommended Instructor Course Contents

D. Course Format and Lesson Plans

E. Portable Fire Extinguishers

F. Section - Lesson Plan

G. Fires in Silos

H. Suspicious Fires

I. Training Material (Masks)

J. Outline - Hospital and Nursing Home Disaster Planning and Emergency Procedure

K. Instruction Evaluation Form

COURSES AVAILABLE

A. Firemanship I (includes the following)

1. Forcible entry, ropes and portable extinguisher practices
2. Ladder practice
3. Hose practice
4. Salvage and overhaul
5. Fire stream practice
6. Apparatus and pump use
7. Ventilation practice
8. Inspection practice
9. Rescue and protective practices

B. Breathing apparatus

C. Courses designed for a specific need depending upon equipment available for special hazards.

EXAMINATION DATE_____ FIRE DEPT_____

TIME_____ PLACE_____

FIREMANS NAME_____ FICA or ID# _____

TIME ALLOWED ----------GRADE ----- NEEDS.

1- In the chain of command, what are two (2) things that are important to be sussessful?_____

2- In classifying fire apparatus, list the things carried?
(a) Double combanition _____
(b) Triple combination_____
(c) Quadruple or Quad _____
(d) Quintuple combination _____

3- What term is used to determine pump size _____

4- Name three types of ladders_____ _____ _____

5- What is meant by the beam of a ladder?_____

6- What is meant by the but of a ladder? _____

7- What is meant by the following?
(a) Ladder bed?_____
(b) Fly ?_____
(c) Halyard ?_____
(d) Guides?_____
(e) Stops ?_____
(f) Pawl ?_____
(g) Bnagor Ladder?_____
(h) Tormentors ?_____

8- What special feature does a roof ladder have _____

9- How generally is an attick ladder constructed _____

10- Name two (2) things to look for when inspecting wooden ladders
1 _____
2 _____

11- Name two things to look for when inspecting metal ladders?
1- _____
2 _____

12- List 3 common diameters of fire hose _____ _____ _____

13- What is the common construction of fire hose _____ _____ _____

14- What are the most common lengths of hose _____ Ft. & Ft.

15- True or False - Hose hase one male, and one female on the end of each length?
_____

16- Name the three things that cause damage to hose and couplings
_____
_____
_____

17- True or False. When returning from a fire, you should immediatly relay the hose beds with the wet hose you have just used. _____

18- If your answer to # 17 is true, What can happen? _____
_____

19- Circle the items listed below that are classified as hose fittings.
Double Male, Halligan Bar, Double Female, Spanner , reducers,
Flyers, Adapters, Siamese, Connections, Y or wye, connections,
4 way gates,

20- At what pressure should hose be tested annually _____p.s.i.

21- Name two (2) types of hose appliances _____&_____

22- What are some of the common sizes of suction hose (hard)
_____ _____ _____

23- What lengths do hard suction hoses come in _____to_____

24- Why do they not reccomend 50 ft. lengths of hard suction hose?
_____

25- What uses are made of hard suction hoses. _____
_____

26- Why do fire department carry double male and double female fittings?
_____
_____

27- what are the two major types of nozzles?
_____ and _____

28- What advantage does a fog or impinging stream nozzle have?
_____
_____

29- List three types of hand tools carried on fire trucks"
_____, _____, & _____

30- What are spanner wrenches used for? _____
_____

EXAMINATION DATE_____ FIRE DEPT._____

TIME_____ PLACE_____

FIREMANS NAME_____ FICA Or ID#_____

_____

TIME ALLOWED _____ ------GRADE _____ -----NEEDS._____

1- What is fire?_____

2- What is flame?_____

3- What is smoke?_____

4- Why does smoke rise?_____

_____

5- Is smoke harmful to firemen?_____

6- Tre or False.The air contains 31% oxygen._____

7- What does a smoldering fire with dense smoke usually indicate?_____

_____

8- True or False. Firemen should have no fear of smoke._____

9- What is meant by combustable or combustable substance?_____

_____

10- What is meant by flame?_____

_____

11- What is meant by flash point?_____

_____

12- True or False. Liquid gasoline burns at - 50 degrees F._____

13- What are the three ways fire travels? _____

_____. _____

14- What three things are necessary for fire to burn? _____

_____ _____

15- How can we put out a fire?_____

_____

16- Why are fires classified into types?_____

_____

17- What are the classes of fire and give examples?

_____ _____

_____ _____

_____. _____

_____ _____

18- What is the most commonly used fire extinguisher?_____

19- what different types of extinguishers are there?_____

20- Of the types lis ted in question 19, How are the contents expelled?

21- True or False. Extinguishers, once charged should not be touched until they are used at a fire._____

22- What type of extinguishers should be used on 1- Class A fires_____
2- Calss B fired_____
3- Class C fires_____
4- Class D fires_____

23- What three things should be done in the strategy of attacking fires?

24- List what is meant by the above three items in question 23

25- When arriving at the scene of a fire, why is it important to get in fast

26- What is meant by ventilation?_____

27- Why ventilate?_____

28- How do we determine how much water is needed to extinguish a fire in a given size building?_____

29- What is meant by salvage?_____
Overhaul?_____

30- Why do we wear protectvie clothing & Equipment?_____

31- What are your two best senses when trying to locate a fire?_____

32 Inclosing waht is your personal opinion of being on a fire department?

RECOMMENDED INSTRUCTOR COURSE CONTENT

FIRE SERVICE INSTRUCTOR

- Instructor Roles and Responsibilities
- Study Habits
  - How to Take Notes
  - How to Study
- Communications
  - Effective Speaking Techniques
  - Effective Listening
- The Psychology of Learning
  - The Principles of Learning
  - The Ways Impressions are Made
- Human Relations
  - Types of Instructors
  - Desirable Instructor Characteristics
  - The Student-Teacher Relationship
  - How to Deal with Problem Students
- Methods of Teaching
  - Demonstration
  - Illustration
  - Lecture
  - Discussion
  - Information Sheets
- The Four-Step Teaching Technique
  - Preparation
  - Presentation
  - Application
  - Testing
- Visual Aids
  - The Effective Use of Visual Aids
- The Teaching-Learning Environment
  - Organizing the Classroom
- Testing
  - Conducting Tests
- Performance Evaluation
  - Student Evaluation
  - Personal Evaluation
- Record-Keeping
  - Attendance Sheets
  - Other Class Records

ADVANCED FIRE SERVICE INSTRUCTOR

- Communications
  - Preparing a Presentation for a Large Audience
  - Conference Leading
- Principles of Leadership

Visual Aids
The Development and Effective Use of Visual Aids
Course Development
Task Analysis
Developing Lesson Plans and Instructor Guides
Writing Performance Objectives
Performance Evaluation
Rating Subordinates
The Teaching-Learning Environment
Planning, Acquiring and Using Training Facilities
Testing
Developing Tests
Evaluating Tests
Record Keeping
Course Records
Personnel Records

MASTER FIRE SERVICE INSTRUCTOR

Course Development
Writing Course Performance Objectives
Developing Instructional Materials
Texts, Handout Materials, etc.
Technical Writing
Programmed Instruction
Self-Study Materials
Visual Aids
Closed Circuit Television
Motion Picture Production
Testing
Developing Course Tests
Training Budget Preparation
Principles of Management

To: All Instructors

From: Frank E. Kloss, Fire Service Training

Subject: Course Format and Lesson Plans

In order to provide uniformity in courses being given, this reminder is provided.

1. All basic firemanship courses will be given in two series. The first series will be known as Series S and the second as the S.P. Series.

2. Classes for Series S will be four in number and be given indoors any time of the year.

3. Series S.P. (Student Participation) will be given in five sessions and should be accomplished outdoors. As an aid to instructors a model outline is provided. Please bear in mind that as an instructor you have the responsibility to plan the program with the chief and give priority to the training he desires. Therefore, this is an outline for guidance.

Planning session with chief

Discuss training needs; determine what the chief wants emphasized. Obtain an inventory of added equipment to use as training aid. If possible, schedule class dates.

Second Session

Introduction, Orientation -- S-1-A
Equipment -- S-1-B
Nature of Fire - S-1-C

Third Session

Chemistry of Fire, Fire Extinguishers -- Code S-2-A
Firefighting Principles and Practices -- Code S-2-B

Fourth Session

Forcible Entry -- Code S-3-A
Ventilation -- Code S-3-B

Fifth Session

Overhauling -- Code S-4-A
Salvage -- S-4-B

Each class containing more than 14 men shall be divided into two groups of nearly equal size, to be known as groups "A" and "B".

Classes shall be scheduled as follows:

First Night	- Hose and Fire Stream Practices	- Group A
Second Night	- Hose and Fire Stream Practices	- Group B
Third Night	- Ladder Practices	- Group A
Fourth Night	- Ladder Practices	- Group B
Fifth Night	- Rescue and Gas Mask Practices	- Groups A & B

The purpose of dividing into two groups is to allow more participation through smaller groups. The same material will be covered with each group, therefore, there will be but three lesson plans. S-P-1 -- "Hose and Fire Stream Practices" -- S-P-2 -- "Ladder Practices" -- S-P-3 -- "Rescue and Gas Mask Practices."

All departments are entitled to thirty hours as part of the course. Do not forget your attendance record should record your effort. If you have any questions, feel free to contact me immediately.

OSHA AND THE FIRE INSPECTOR

SECTION I - PORTABLE FIRE EXTINGUISHERS

To present all the various rules and regulations of OSHA pertaining to fire safety would be impossible. For this reason we will limit our discussion to the third most cited deficiency in industry, PORTABLE FIRE EXTINGUISHERS.

The reference material used in this presentation is taken from -

The NFPA Guide to OSHA Fire Regulations, Volume 1, 2nd Edition 1972, Subpart J, Section 1910.144 Safety Color Code and Marking Physical Hazards, Subpart L-Fire Protection, Sections 1910.156 Definitions and 1910.157 Portable Fire Extinguishers.

and

NFPA Standards -

10-1970 Standard for Installation of Portable Fire Extinguishers

10-A 1970 Recommended Good Practice for the Maintenance and Use of Portable Fire Extinguishers

This reference material is available from:
National Fire Protection Association
60 Batterymarch Street
Boston, Mass. 02110

1910.144 Safety Color Code for Marking Physical Hazards

(a) Color identification - (1) RED. Red shall be the basic color for the identification of:
(i) FIRE PROTECTION EQUIPMENT AND APPARATUS. (a) Fire alarm boxes (pull boxes).

(b) Fire blanket boxes

(c) Fire buckets or pails

(d) Fire exit signs

(e) Fire extinguishers (if painting the extinguisher is impracticable or undesirable, color should be used on the housing, wall or support to identify the location.

(f) Fire hose locations - (reel, support or housing only)

(g) Fire hydrants (industrial)

(h) Fire pumps

(i) Fire sirens

(j) Post indicator valves (sprinkler systems)

(k) Sprinkler piping

(ii) DANGER. Safety cans or other portable containers of flammable liquids having a flash point at or below 80° F. excluding shipping containers, shall be painted red with some additional clearly visible identification either in the form of a yellow band around the can or the name of the contents conspicuously stenciled or painted on the can in yellow.

1910.157 PORTABLE FIRE EXTINGUISHERS

(a) GENERAL REQUIREMENTS - (1) OPERABLE CONDITION. Portable extinguishers shall be maintained in a fully charged and operable condition, and kept in their designated places at all times when they are not being used.

(2) LOCATION. Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. They shall be located along normal paths of travel.

(3) MARKING OF LOCATION. Extinguishers shall not be obstructed or obscured from view. In large rooms, and in certain locations where visual obstructions cannot be completely avoided, means shall be provided to indicate the location and intended use of extinguishers conspicuously.

(4) MARKING OF EXTINGUISHERS. If extinguishers intended for different classes of fires are grouped, their intended use shall be marked conspicuously to insure choice of the proper extinguisher at the time of fire.

(5) MOUNTING OF EXTINGUISHERS. Extinguishers shall be installed on the hangars or in the brackets supplied, mounted in cabinets, or set on shelves unless the extinguishers are of the wheeled type.

(6) HEIGHT OF MOUNTING. Extinguishers having a gross weight not exceeding 40 pounds shall be installed so that the top of the extinguisher is not more than 5 feet above the floor. Extinguishers having a gross weight greater than 40 pounds (except wheeled types) shall be so installed that the top of the extinguisher is not more than 3 ½ feet above the floor.

(7) CABINET MOUNTING. Extinguishers mounted in cabinets or wall recesses or set on shelves shall be placed in a manner such that the extinguisher operating instructions face outward. The location of such extinguishers shall be marked conspicuously.

(8) VIBRATING LOCATIONS. Extinguishers installed under conditions where they are subject to severe vibration shall be installed in brackets specifically designed to cope with this vibration.

(9) TEMPERATURE RANGE. Extinguishers shall be suitable for use within a temperature range of at least +40 degrees F. to 120 degrees F.

(10) EXTREME TEMPERATURE EXPOSURE. When extinguishers are installed in locations subjected to temperatures outside the range prescribed in this subparagraph, they shall be of a type approved or listed for the temperature to which they will be exposed, or placed in an enclosure capable of maintaining the temperature within the range prescribed in this subparagraph.

GENERAL. The selection of extinguishers for a given situation will depend upon the character of the fires anticipated, the construction and occupancy of the individual property, the vehicle or hazard to be protected, ambient- temperature conditions and other factors. The number of extinguishers required shall be determined by reference to paragraph (c) of this section.

(2) SELECTION BY HAZARD. (i) Extinguishers shall be selected for the specific class or classes of hazards to be protected in accordance with the following paragraphs.

(ii) Extinguishers for protecting Class A hazards shall be selected from among the following:

Foam	Multi-purpose dry chemical
Loaded stream	Water types

Certain smaller extinguishers which are rated on Class B and Class C fires, but have insufficient effectiveness to earn the minimum 1-A rating even though they have value in extinguishing smaller Class A fires.

Such smaller extinguishers shall not be used to meet the requirements of paragraph (c) (z) (i) of this section.

(iii) Extinguishers for protection of Class B hazards shall be selected from the following:

Bromotrifluoromethane	Foam
Carbon dioxide	Loaded stream
Dry Chemical	Multi-purpose dry chemical

Extinguishers with ratings less than 1-B shall not be considered in determining suitability.

(iv) Extinguishers for protection of Class C hazards shall be selected from the following:

Bromotrifluoromethane	Carbon dioxide
Dry Chemical	Multi-purpose dry chemical

NOTE: Carbon dioxide extinguishers equipped with metal horns are not considered safe for use on fires in energized electrical equipment and, therefore are not classified for use on Class C hazards.

(v) Extinguishers and extinguishing agents for the protection of Class D hazards shall be of types approved for use on the specific combustible-metal hazard.

(c) DISTRIBUTION OF PORTABLE FIRE EXTINGUISHERS

(1) GENERAL (i) The number of fire extinguishers needed to protect a property shall be determined as prescribed herein, considering the area and arrangement of the building or occupancy, the severity of the hazard, the anticipated classes of fires, and the distances to be traveled to reach extinguishers.

(ii) Fire extinguishers shall be provided for the protection of both the building structure, if combustible and the occupancy hazards contained therein.

(iii) Required building protection shall be provided by fire extinguishers suitable for class fires.

(iv) Occupancy hazard protection shall be provided by fire extinguishers suitable for such Class A, B, C, or D fire potentials as may be present.

(v) Extinguishers provided for building protection may be considered also for the protection of occupancies having a Class A fire potential.

(vi) Combustible buildings having an occupancy hazard subject to Class B, and/or Class C fires, shall have a standard complement of Class A extinguishers as required by Table L-1 for building protection, plus additional Class B and/or Class C extinguishers. Where fire extinguishers have more than one letter classification (such as 2-A; 20-BC), they may be considered to satisfy the requirements of each letter class.

(vii) Rooms or areas shall be graded generally as light hazard, ordinary hazard or extra hazard. Limited areas of greater or lesser hazard shall be protected as required.

(2) FIRE EXTINGUISHER SIZE AND PLACEMENT FOR CLASS A HAZARDS. (i) Minimal sizes of fire extinguishers for the listed grades of hazard shall be provided on the basis of Table L-1, Extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table L-1.

TABLE L-1

Basic Minimum Extinguisher rating for area specified	Maximum travel distance to extinguisher (feet)	Areas to be protected per extinguisher: Light hazard occupancy sq. feet	Ordinary hazard occupancy sq. feet	Extra hazard occupancy sq. feet
1A	75	3,000	NOTE 1	NOTE 1
2A	75	6,000	3,000	NOTE 1
3A	75	9,000	4,500	3,000
4A	75	11,250	6,000	4,000
6A	75	11,250	9,000	6,000

NOTE 1: Not permitted except as specified in subdivision (ii) of this subparagraph.

(ii) The protection requirements specified in Table L-1 may be fulfilled by several extinguishers of lower ratings for ordinary or extra hazard occupancies.

(iii) Where the floor area of a building is less than that specified in Table L-1, at least one extinguisher of the minimum size recommended shall be provided.

(iv) The protection requirements may be fulfilled with extinguishers of higher rating provided the travel distance to such larger extinguishers shall not exceed 75 feet.

(3) FIRE EXTINGUISHER SIZE AND PLACEMENT FOR CLASS B FIRES OTHER THAN FOR FIRES IN FLAMMABLE LIQUIDS OF APPRECIABLE DEPTH. (i) Minimal sizes of fire extinguishers for the listed grades of hazard shall be provided on the basis of Table L-2. Extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table L-2.

TABLE L-2

TYPE OF HAZARD	Basic Minimum Extinguisher Rating	Maximum travel-distance to extinguishers (feet)
Light	4B	50
Ordinary	8B	50
Extra	12B	50

NOTE: Where this section calls for minimum extinguisher ratings of 4-B, 8-B, or 12-B, the requirements may be met by existing extinguishers or multiple foam extinguishers as allowed by paragraph (c) (3) (ii) of this section. However, if a single extinguisher must be purchased to fulfill such requirements, the next higher rating shall be used.

(ii) Two or more extinguishers of lower rating, except for foam extinguishers shall not be used to fulfill the protection requirements of Table L-2.

2 ½ gallon Foam 4-B — Up to three foam extinguishers may be used to fulfill these requirements. (12-B rating)

(iii) The protection requirements may be fulfilled with extinguishers of higher ratings provided the travel distance to such larger extinguishers shall not exceed 50 feet.

(4) FIRE EXTINGUISHER SIZE AND PLACEMENT FOR CLASS B FIRES IN FLAMMABLE LIQUIDS OF APPRECIABLE DEPTH (i) For flammable liquid hazards of appreciable depth (Class B), such as in dip or quench tanks, Class B fire extinguishers shall be provided on the basis of one numerical unit of Class B extinguishing potential per square foot of flammable liquid surface of the largest tank hazard within the area.

NOTE: Appreciable depth is defined as a depth of liquid greater than one-quarter inch.

(ii) Two or more extinguishers of lower ratings except for foam extinguishers shall not be used in lieu of the extinguisher required for the largest tank. Up to three foam extinguishers may be used to fulfill these requirements. (12-B rating)

(iii) Scattered or widely separated hazards shall be individually protected if the specified travel distances in subdivisions (i) and (iii) of subparagraph (5) of this paragraph (c) are exceeded. Likewise, extinguishers in the proximity of a hazard shall be carefully located so as to be accessible in the presence of a fire without undue danger to the operator.

(5) FIRE EXTINGUISHER SIZE AND PLACEMENT FOR CLASS C HAZARDS. (i) Extinguishers with Class C ratings shall be required where energized electrical equipment may be encountered which would require a nonconducting extinguishing media. This will include fire either directly involving or surrounding electrical equipment. Since the fire itself is a Class A or Class B hazard the extinguishers are sized and located on the basis of the anticipated Class A or B hazard.

(d) INSPECTION, MAINTENANCE, AND HYDROSTATIC TESTS. (1) GENERAL (i) The employer shall be responsible for such inspection, maintenance and testing.

(ii) For details of conducting needed inspections, proper maintenance operations, and required tests, see NFPA standard 10-A 1970 Maintenance and Use of Portable Extinguishers.

(2) INSPECTION (i) Extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require, to insure they are in their designated places, to insure they have not been actuated or tampered with, and to detect any obvious physical damage, corrosion, or any other impairments.

(ii) Any extinguishers showing defects shall be given a complete maintenance check.

(3) MAINTENANCE. (i) At regular intervals, not more than 1 year apart, or when specifically indicated by an inspection, extinguishers shall be thoroughly examined and/or recharged or repaired to insure operability and safety; or replaced as needed.

(ii) Extinguishers removed from the premises to be recharged shall be replaced by spare extinguishers during the period they are gone.

(iii) Pails or drums of powder-extinguishing agents for scoop or shovel application to metal fires shall be kept full at all times.

(iv) Each extinguisher shall have a durable tag securely attached to show the maintenance or recharge date and the initials or signature of the person who performs this service.

(4) HYDROSTATIC TESTS. (i) If, at any time, an extinguisher shows evidence of corrosion or mechanical injury, it shall be subjected to a hydrostatic pressure test or replaced.

(ii) For evaluating the condition of extinguisher cylinders made to Department of Transportation specifications (cf 49 CFR Chapter I) see the Standard for Visual Inspection of Compressed Gas Cylinders (CGA-C-6) published by the Compressed Gas Association, 500 Fifth Avenue, New York, N.Y. 10036.

(iii) At intervals not exceeding those specified in Table L-3 and subdivision (iv) of this subparagraph, extinguishers shall be hydrostatically tested. The first hydrostatic retest may be conducted between the fifth and sixth years for those with a designated test interval of 5 years.

TABLE L-3

Hydrostatic Test Interval
For Extinguishers

Extinguisher Type	Test Interval (year)
Soda-Acid	5
Cartride operated water/anti-freeze	5
Storage pressure water/anti-freeze	5
Wetting agent	5
Foam	5
Loaded stream	5
Dry chemical (stainless steel, aluminum or soldered brass shells)	5
Carbon dioxide	5
Dry Chemical (brazed brass, mild steel shells)	12
Bromotrifluoromethane	12
Dry Powder extinguishers for metal fires	12

NOTE: Cylinders under jurisdiction of the Department of Transportation (U.S.) may require hydrostatic testing at more frequent periods.

(iv) Nitrogen cylinders (or other cylinders used for inert-gas storage), such as found on wheeled extinguishers, shall be tested at 5 year intervals.

(v) On those extinguishers which are equipped with a shutoff nozzle at the outlet end of the hose, a hydrostatic test shall be performed on the hose with its couplings (but without discharge nozzle) at the test interval specified for the unit on which the hose is installed.

(vi) The test pressure for dry chemical and dry powder hose assemblies requiring a hydrostatic test shall be at a test pressure of 300 pounds per square inch for a 1 minute period. Carbon dioxide hose assemblies requiring a hydrostatic test shall be a test pressure of 1,250 p.s.i. for a 1 minute period.

(vii) The hydrostatic tests are not required on fire pails, pump-type water and/or anti-freeze extinguishers, and factory-sealed disposable (non-refillable) containers. If such an extinguisher or water pail shows evidence of corrosion or mechanical inquiry, it may be unsafe or unsuitable for further use and shall be replaced with a new unit.

(viii) The hydrostatic test date shall be recorded on a record tag of metal or equally durable material, or a suitable metallized decal which shall be affixed (by a heatless process) to the shell of an extinguisher which favorably passes the hydrostatic test. The record tag shall contain the following information: Date of test, test pressure, and name or initials of person or agency making the test.

(ix) For extinguishers subjected to an original factory test pressure of 350 p.s.i. or greater, the test pressure shall be 75 percent of the factory test pressure (as noted on the extinguisher nameplate), but in no case less than 300 p.s.i., see Table L-4. For extinguishers subjected to an original factory test pressure for more than 350 p.s.i.,

the test pressure shall be 75 percent of the factory test pressure; see Table L-4. Pressure shall be applied at a rate of rise to reach the test pressure in approximately 1 minute, and the pressure shall be held for 1 minute, after which it shall be released.

TABLE L-4

Hydrostatic Test Pressure Requirements - NON ICC Shells
Shells Not Specified by U.S. D.O.T.

Extinguisher Type	Original Factory Test Pressure	Requires Hydrostatic Test Pressure
All dry chemical and dry powder	400 p.s.i. or greater	75% of Factory Test Pressure
	350-399 p.s.i.	300 p.s.i.
	below 350 p.s.i.	75% of Factory Test Pressure
Foam	500 p.s.i.	375 p.s.i.
Foam	350 p.s.i.	300 p.s.i.
Soda-acid	500 p.s.i.	375 p.s.i.
Soda-acid	350 p.s.i.	300 p.s.i.
Stored pressure or cartride operated water type (including anti-freeze and loaded stream)	400 p.s.i. or greater	75% of Factory Test Pressure
	350-399 p.s.i.	300 p.s.i.
	below 350 p.s.i.	75% of Factory Test Pressure

(x) Carbon dioxide extinguishers, nitrogen cylinders, and other cylinders or cartridges used for the storage of inert compressed gases shall be hydrostatically tested in accordance with the requirements of the U.S. Department of Transportation (See 49 CFR Parts 171-190)

(xi) Extinguisher shells, cartridges or cylinders which show leakage or permanent distortion in excess of specified limits, or which rupture, shall be removed from service.

WISCONSIN FIRE SERVICE TRAINING
LESSON PLAN

CODE-S-2-A
TIME - 10 MIN.

COURSE: STANDARD

LESSON: ELEMENTS OF FIRE AND METHODS OF EXTINGUISHMENT

EQUIPMENT REQUIRED: NONE

TRAINING AIDS: BLACKBOARD, CHALK, ERASER, OR EASEL

INSTRUCTOR'S NOTES	TEACHING POINTS

INTRODUCE LESSON

OBJECTIVE:

To learn what fire is, types of fires, type and uses of a number of hand extinguishers, and advantages of various extinguishers.

1. Definition: Fire results from a proper combination of FUEL, OXYGEN and HEAT

   a. Fuel is any substance which will burn (Examples: wood, paper, gasoline)
   b. Oxygen is an element present as a gas in the earth's atmosphere. 21% of the air we breathe is composed of oxygen.
   c. Heat is a form of energy when applied to a substance causes it to increase in temperature.

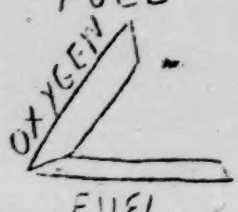
2. Liquid or solid fuel itself does not burn. As heat is applied and the temperature rises, a combustible gas is given off and this gas is ignited by the heat. The fuel disappears as it converts to a gas and the gas is consumed as a fuel for the flame.

FIRE TRIANGLE

DEVELOP THIS DIAGRAM ON THE BLACKBOARD

1.

FIRE All three are required for fire

2. 

NO FIRE Remove HEAT - NO FIRE

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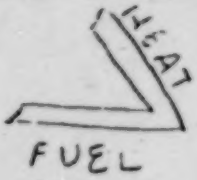
INSTRUCTOR'S NOTES

TEACHING POINTS

3. 

Remove OXYGEN - NO FIRE

NO FIRE

4.

Remove FUEL - NO FIRE

NO FIRE

1. Disturbing the fire triangle by removing any ONE component will extinguish the fire.

   a. Most common method of doing this is by REDUCING THE HEAT
      (1) water is placed in contact with a heated fuel.
      (2) heat is transferred from fuel to water (a law of physics states that if two bodies of different heat energies or temperatures are placed together, heat will leave the hotter body and pass to the cooler one).
      (3) this transfer is a cooling effect and reduces the temperature of the fuel until the heat factor in the triangle of fire is eliminated.

   b. Next most common method is by excluding oxygen. Examples:
      (1) non-combustible blanket of foam substance is spread over the heated fuel. Oxygen in the air is used up and not replaced.
      (2) non-combustible gas such as carbon dioxide replaces the air around the heated fuel and the air supply is cut off, extinguishing the fire.

   c. By removing the fuel
      Example:
      (1) shutting off valve on supply line of flammable liquid or gas.

WISCONSIN FIRE SERVICE TRAINING
LESSON PLAN

CODE-S-2-B-1
TIME - 10 MIN.

COURSE: STANDARD

LESSON: TYPES OF FIRES

EQUIPMENT REQUIRED: NONE

TRAINING AIDS: BLACKBOARD, CHALK ERASER, OR EASEL

INSTRUCTOR'S NOTES	TEACHING POINTS
	A. Why Fires are Classified Into Types Over the years firemen have found that fires fall into three general classes. This has been done to 1. IDENTIFY KIND of fire 2. IDENTIFY HAZARDS present 3. Enable firemen to select METHOD OF EXTINGUISHMENT These classes are universally used in the fire service. B. Class "A" Fires Fires in ordinary solid combustible materials. Examples: 1. wood 2. paper 3. rags 4. straw 5. grass ASK STUDENTS FOR OTHERS C. Class "B" Fires Fires where fuels are flammable liquids, gases and greases. Examples: 1. gasoline 2. oil paints 3. kerosene 4. lubricating oils 5. ether

D. Class "C" Fires

Fires involving electrical appliances and instillations.
Examples:

1. electric motors
2. power transformers
3. overloaded and shorted circuits
4. radio and television sets

ASK STUDENTS FOR EXAMPLES

E. Fires Not Easily Classified

1. Products which make classification difficult

   a. magnesium and other pyrophoric metals
   b. rubber
   c. any substance producing oxygen when heated

2. A particular fire situation which may involve several fuels in two or more classes
   Example:

   a. Petroleum products stored in a wooden shack near electrical apparatus, on fire.

ASK STUDENTS FOR SIMILAR EXAMPLES

SUMMARIZE THIS LESSON WITH SHORT AROUND-THE-ROOM QUESTIONING

WISCONSIN FIRE SERVICE TRAINING
LESSON PLAN

CODE-S-2-B-2
TIME - 10 MIN.

COURSE: STANDARD

LESSON: PLAIN WATER EXTINGUISHERS

EQUIPMENT REQUIRED: PUMP TANK EXTINGUISHER, GAS IMPELLED PLAIN WATER EXTINGUISHER

TRAINING AIDS: BLACKBOARD, CHALK, ERASER, POINTER, (PUMP TANK EXTINGUISHER) (GAS IMPELLED WATER EXTINGUISHER)

INSTRUCTOR'S NOTES	TEACHING POINTS

A. What is a Plain Water Extinguisher

Definition: Any extinguisher using plain water

B. Water Pail

1. Water pail is a common plain water extinguisher
2. Use: always toss the water so it hits the base of the flames

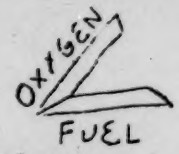
C. Pump Tank Extinguisher

Definition: Hand pump tank is the most common plain water extinguish

1. Types: (operation is similar for both
   a. Hand carry
   b. Knapsack

2. Principle of extinguishment is cooling or heat reduction

DRAW DIAGRAM ON BALCKBOARD



NO HEAT - NO FIR

3. Operation:

DEMONSTRATE WITH FILLED EXTINGUISHE

a. Carrying
   (1) hand carrying - lift by placing hand on handle

(2) knapsack
(a) squat in front of extinguisher
(b) hold right strap with left hand
(c) put right arm through right strap
(d) with left hand lift right strap over right shoulder, raising extinguisher on bac
(e) bring right arm up
(f) raise to up-right position; slightly bent forward at waist
(g) place left arm through left strap
(h) adjust for comfort

b. Using Extinguisher
(1) hand carry
(a) move plunger up and down with one hand
(b) direct stream to base of flames with other hand
(2) kanpsack
(a) hold pump barrel in left hand
(b) with right hand move plunger handle forward and backward in a repetitive motion while directing to base of flame

4. Facts

a. Capacity
(1) hand carry - 2½ to 5 gallons
(2) knapsack - 5 gallons

b. Refill - all types are similar
(1) open cap or lid
(2) fill using clean water

c. Care
(1) keep clean
(2) prevent clogging
(3) mixture not anti-freeze unless extinguisher is designed as non-corrosive when special chemicals are added

D. Gas Impelled Plain Water Extinguisher

1. Types

   a. Stored pressure type of plain water extinguisher

2. Principle of extinguishment is cooling or heat reduction

   REFER TO PREVIOUS DIAGRAM ON BALCKBOAR

3. Operation

   a. Carrying
      (1) grasp hose near nozzle with right hand
      (2) bring right hand up to lid handle
      (3) while holding hose between thumb and forefinger, grasp lid handle with four fingers and lift extinguisher

   b. Using extinguisher
      (1) invert extinguisher
      (2) bump hard to rupture internal gas cartridge; gas will be released (CO_2 or other gas) will expel the water
      (3) direct stream to the base of flames

4. Facts

   a. Capacity - 2½ gallons
   b. Refill
      (1) fill lower chamber with water
      (2) insert new gas cartridge

   c. Care
      (1) keep clean
      (2) prevent clogging of nozzle
      (3) weigh gas cartridge semi-annually (weight of cartridge and gas is stamped on each cartridge)

WISCONSIN FIRE SERVICE TRAINING
LESSON PLAN

CODE-S-2-B-5
TIME - 10 MIN.

COURSE: STANDARD

LESSON: DRY CHEMICAL EXTINGUISHERS

EQUIPMENT REQUIRED: DRY CHEMICAL EXTINGUISHER

TRAINING AIDS: BLACKBOARD, CHALK, ERASER, POINTER

INSTRUCTOR'S NOTES	TEACHING POINTS
	A. What is a Dry Chemical Extinguisher? Definition: An extinguisher using a treated sodium bicarbonate dust (with additional ingredients) expelled under pressu of a compressed gas. DEMONSTPATE USING CHARGED EXTINGUISHER B. Dry chemical extinguisher 1. Stored pressure type a. Hand carry 2. Principle of extinguishment is breakin up union of fuel and oxygen. REFER TO PREVIOUS DIAGRAM ON BALCKBOARD 3. Operation a. Carrying (1) there are a number of differer styles produced by different manufacturers. The student fireman should inspect the extinguishers in his departmer to observe the specific metho used in carrying and discharg (2) grasp handle (3) lift extinguisher and carry b. Using extinguisher (1) releasing gas (a) one type requires puncturing a gas filled cylinder (b) another type requires opening a valve on the gas filled cylinder (2) where flow control valve is in the handle, pressure on trigger will produce extinguishing agent. Stream is

directed by moving extinguishe

(3) where flow control valve is at hose nozzle, pressure on lever will produce extinguishing agent. Stream is directed by holding extinguish with left hand. With right hand holding hose at nozzle, squeeze valve lever and direct stream

(4) direct stream to base of flames using a fanning action while advancing.

DEMONSTRATE FANNING ACTION USING EXTINGUISH
(DO NOT DISCHARGE EXTINGUISHER)

4. Facts

a. Capacity - a variety of sizes; 5, 7½, 12, 20, 25, 30 lbs. and others

b.

(1) content - chemically treated, waterproof sodium bicarbonate in free-flowing dust form

(2) construction

(3) chemical reaction - none. Ca (carbon dioxide nitrogen, compressed air) expels powder at high velocity forming a dust cloud

c. Care

(1) gas cartridge or cylinder should be removed and weighed annually

(2) replace inadequate cartridges or cylinders

(3) recharge immediately after us

(4) check regularly for powder content and condition.

Note: Make sure you know how to use their extinguishers before you start lesson - and that they all know how before you finish.

References

Oklahoma A. & M. Manual
Forcible Entry and Minor Extinguishment
Practices - and Instructor Guide Sheets for same

University of Maryland Firemans Training Course Section I - Basic
Charts and dates available from various manufacturers of extinguishers

Resource Credit

Code S-2-A and B is adapted from New York State Firemens Trainin; Program Lesson Plans by Donald O'Brien and Leonard Silvern

WISCONSIN FIRE SERVICE TRAINING
LESSON PLAN

CODE-S-2-B-6
TIME - 10 MIN.

COURSE: STANDARD

LESSON: CO_2 EXTINGUISHERS

EQUIPMENT REQUIRED: CO_2 EXTINGUISHER

TRAINING AIDS: BLACKBOARD, CHALK, ERASER, POINTER, (CO_2 EXTINGUISHER)

INSTRUCTOR'S NOTES	TEACHING POINTS

A. What is a CO_2 Extinguisher?

Definition: An extinguisher using carbon dioxide gas for both expulsion and extinguishment.

DEMONSTRATE USING CHARGED EXTINGUISHER

1. Stored pressure type
   a. Hand carry

2. Principle of extinguishment is excluding oxygen by producing a non-combustible blanket. There is some cooling effect at close range.

REFER TO PREVIOUS DIAGRAM ON BLACKBOARD

3. Operation
   a. Carrying
      (1) grasp handle with one hand
      (2) lift extinguisher and carry
   b. Using extinguisher
      (1) at fire, set on ground
      (2) with one hand, pull safety pin
      (3) grasp insulated hand grip or horn with one hand and remove from clip
      (4) point horn to base of flames as close to fire as practicable
      (5) pull trigger valve or turn hand wheel valve depending on manufacturers' style
      (6) direct stream, fanning very slowly from side to side

DEMONSTRATE FANNING ACTION USING EXTINGUISHER (DO NOT DISCHARGE EXTINGUISHER)

WATCH OUT FOR SILAGE GAS

Why Be Aware of This Danger?

Silage fermentation may produce several kinds of gas, including carbon dioxide and nitric oxide (which in turn produces nitrogen dioxide). Carbon dioxide is non-poisonous, although it can cause suffocation through lack of oxygen. However, nitrogen dioxide (NO_2) is poisonous. It kills and injures people as well as livestock. Since 1955, a dozen people and many farm animals in the Midwest have died from this poisoning. During this time, 37 Wisconsin farmers have reported serious lung injury from inhaling nitrogen dioxide. Some of this damage was permanent and other cases have probably gone completely unreported. Frequently, a relapse with symptoms like pneumonia occurs 2 weeks after initial recovery from the exposure.

Nitrogen dioxide represents a real hazard on the farm because:

1. Exposure can be rapidly fatal.
2. Formation of nitrogen dioxide may occur whenever silage is made.
3. Silage is a popular, highly desirable feed.

What Is This Gas?

Nitrogen dioxide is a lethal gas which is yellowish-brown and smells like some laundry bleaches. On further oxidation, it forms N_2O_5 which in turn forms a highly-corrosive nitric acid when combined with water. Since oxidation may occur in the body, you can easily imagine the permanent lung damage nitrogen dioxide produces.

Nitrogen dioxide is heavier than air and will therefore remain beneath the air mass over the silage. It layers on top of the silage below the upper edge of the top door or will settle down through the chute. It may also seep through the drain at the base of the silo. It often concentrates in the silo room and moves into the barn. It will leave a yellow stain on silage, wood or any other material it contacts.

Why Is Nitrogen Dioxide Formed?

Shortly after ensiling green plant material, oxygen is used up in fermentation and the nitrates present in the plant are released as nitric oxide (NO). This heavy, non-lethal gas quickly escapes from the silage and combines with oxygen in the air to form toxic nitrogen dioxide.

Nitrogen dioxide gas is produced from ensiled plants that contain free nitrate (NO_3) which hasn't been converted to protein. Normally, nitrogen is taken up by plants as nitrate and converted to protein during proper growth. However, when plant growth is retarded by adverse growing conditions or when excessive amounts of nitrogen are available in the soil, nitrates not converted to protein accumulate in the plant stems and leaves. When such plants are ensiled, the nitrate present may be converted to nitrogen dioxide gas or it may be lost in the seepage. Even though considerable nitrogen dioxide escapes during ensiling, enough nitrate may remain in the silage to poison livestock in feeding.

Certain weeds and all crop plants store nitrate if they take up more than they convert to protein. Some plants store more nitrate than others. Analyses of plants in Wisconsin revealed the following maximum percentages of stored nitrate:

	Percentage of dry matter as NO_3
Weeds	7.5
Corn, sudan grass, sorghums	5.0
Oats, wheat, barley, rye	4.0
Brome, orchardgrass, timothy	3.0
Alfalfa, red clover	1.0

Thus, grass-legume silage is less apt to produce nitrogen dioxide gas than other ensiled crops. Weeds in the ensiled crop may produce NO_2 gas (or nitrate poisoning) even when the crop itself contains no nitrate.

What Causes Nitrate Accumulation in Plants?

1. Prolonged summer drought followed by rain just before ensiling.
2. High levels of nitrogen in the soil created by excessively high rates of fertilization with commercial nitrogen or with a combination of commercial nitrogen, barnyard manure and/or plowing down leguminous green manure crops.
3. Unbalanced N-P-K fertility (especially high N, low P-K).
4. Unfavorable temperature (too cold for corn, too hot for oats).
5. Shade (prolonged cloudy weather, dense stands) which reduces photosynthetic activity.
6. Leaf damage - from partial drought, partial frost, insects, diseases, chemicals - while the stem remains active.
7. Root damage - from cultivation, insects, diseases, chemicals.

Can Nitrate Accumulation Be Prevented?

Under certain environmental conditions (particularly drought), nitrates will accumulate in plants fertilized with nitrogen at recommended rates. However, with proper precautions the hazard of nitrogen dioxide protection shouldn't discourage fertilizing at recommended rates for maximum production of silage crops. Proper fertilization combined with good cultural methods (proper weed, insect and disease control measures) will reduce the chances for the production of nitrogen dioxide gas at the time of ensiling the crop.

How To Minimize the Danger

1. <u>While growing the crop</u>.

   Apply adequate nitrogen, but don't overdo. As a guide, corn needs 1.2 lbs. of N per bushel yield; oats for silage should have no more than 75 lbs. of N available for each harvest. Follow the recommendations on soil analysis reports.

   Use balanced N-P-K fertilizers; add minor elements if needed.

   Use disease and insect resistant varieties and/or spray to control insect and disease damage to leaves and roots.

   Keep fields relatively weed-free. Weeds can make silage dangerous.

   After a drought, rapid nitrate uptake occurs in the plant following rain. Therefore, harvest the crop before fall rains, or wait at least 5 days after a rain.

   Plants damaged by hail should be harvested immediately before the plant takes up nitrates.

2. <u>While filling the silo</u>.

   The greatest danger from nitrogen dioxide gas from silage is during the first 12 to 60 hours after filling. However, be especially careful for 10 days after filling the silo.

   Be on the alert for bleach-like odors and/or yellowish-brown fumes in or near the silo. Small amounts of the gas may not be visible and not easily detected by smell, but are still dangerous.

   Stay out of, or away from, the silo immediately after filling and especially the following day.

   If you must enter the silo, run the silage blower for 15 to 20 minutes first. Never enter the silo alone during the danger period.

Source: Circular 624 (10/63) Extension Service, College of Agriculture, Univ. of Wisconsin at Madison, Wisc. Also Miscellaneous Bulletin 37 "Nitrates in Forage Crops and Silage" Cornell University, Ithica NY

FIRES IN SILOS

With the trend over the past few years of going to low moisture grass silage (haylage) there have been a number of fires reported in both conventional and sealed silos throughout the United States. Much work on this problem has been conducted by the Land Grant Colleges throughout the Midwest and Eastern parts of the United States. Listed below are nine reasons why silo fires can start. One or more of the nine reasons can contribute to a fire in your silo.

1. Chopping grass silage too dry. Thirty percent to thirty-five percent moisture is the fire zone.
2. Chopping grass silage too long. A 1 1/2" to 2 1/2" actual cut is too long.
3. Chopping grass silage too mature. Full bloom to seed state of alfalfa can be a problem.
4. Chopping grass silage after it has been mowed and rained on can cause a fire.
5. Silo walls not properly sealed.
6. Silo doors not properly sealed.
7. Poor distribution of silage when filling.
8. Silo drain not closed allowing air to enter the bottom of the silo. (low moisture silage)
9. Frozen alfalfa put up in late fall or reconstituted bailed hay with water added.

The following are the major required steps in making top quality low moisture grass silage with the minimum possibility of a silo fire.

1. Chop grass silage between 45 to 65 percent moisture (test moisture of forage being ensiled).
2. Chop grass silage fine so that the actual length is not over 1/2" to 1" in length. In no case should there be more than 10 percent over 1 1/2" in length. Keep knives sharp and set close to shear bar.
3. Chop alfalfa silage in the bud stage and grass in the boot stage.
4. Mow and condition only what can be put up in a single day. Prevent cut crop from being rained on.
5. Keep silo walls sealed and in good condition.
6. Check all silo doors for a proper seal and make sure they are in good condition. A seal on old doors can be accomplished by applying a sealant on the lip of the door frame.
7. Silo should have a good center fill or mechanical silage distributor in order to keep silage uniform from bottom to top.
8. For low moisture silage seal any and all drains before filling.
9. Do not put up frozen alfalfa in late fall.

Follow these nine steps to the letter and you will do much to eliminate the possibility of a silo fire. You will also end up with a top quality forage that can contain up to 20 percent protein and 63 percent total digestible nutrients (TDN) on a dry matter basis. This equals more milk and better beef production.

A SUSPICIOUS FIRE ---- NOW WHAT?

I. COMMENTS:

A. Topics Covered

1. Responsibilities of fire and police officials at the fire scene.
2. Role of the insurance industry in the investigation.
3. Searching the fire scene to determine point of origin and cause.
4. If it is now determined that we have a suspicious fire, what do we do next?

II. PROTECTION OF THE FIRE SCENE

A. Arson is a very important factor for every fireman to keep in mind whenever he is called upon to answer an alarm or investigate a fire. The fireman is the one who is best able to determine the cause of a fire while it is burning.

Remember, the fireman can make or break a good arson case, and any investigator needs your help, we would never make a good arson case without your help. No one can do more to aid in trapping an arsonist, or by his carelessness or failure to detect and preserve evidence, aid his escape, then the first fireman on the scene.

B. The responsibility for detecting and perserving evidence of arson is primarily that of the fire investigator. The fire fighter, although not a criminal investigator, does share this obligation.

In order to obtain maximum investigative results, there <u>must be cooperation</u> between the fire fighter and the arson investigator. The fire investigator should be called to the scene as soon as possible if there is cause for suspicion or direct evidence of an incendiary fire. Failure to give prompt notification could result in the premature overhauling of the scene, which might result in the destruction of arson evidence.

B. (CONTINUED)

THE PROTECTION OF FIRE SCENES IS MOST IMPORTANT WHERE SUSPICIOUS CIRCUMSTANCES EXIST OR WHERE EVIDENCE OF INCENDIARISM IS FOUND. IMMEDIATE STEPS SHOULD BE TAKEN TO ASSURE THAT UNAUTHORIZED PERSONS ARE NOT PERMITTED ON THE PREMISES UNTIL THE FIRE SCENE HAS BEEN COMPLETELY EXAMINED, PHOTOGRAPHED, AND SEARCHED FOR EVIDENCE BY INVESTIGATORS.

C. EVIDENCE OF FORCIBLE ENTRY, OR LACK OF SAME.

1. RECORD WHO FIRST ENTERED THE BUILDING AND HOW ENTERED.
2. NO FORCEFUL ENTRY, CAN REASONABLY SUSPECT THERE IS A POSSIBILITY THAT THE PERSON OR PERSONS WHO SET THE FIRE ENTERED THE BUILDING WITH A KEY.
3. EVIDENCE OF FORCEFUL ENTRY
   (A) MAY HAVE BEEN SET TO COVER UP ANOTHER CRIME
   (B) MAY HAVE BEEN A GRUDGE FIRE
   (C) VANDALISM
   (D) SET BY SOMEONE HIRED BY OWNER FOR INSURANCE PURPOSES
   (E) FORCEFUL ENTRY BY OWNER TO CONVEY THE IMPRESSION OF A B & E.
4. SECURITY OF THE BUILDING COULD HELP DIRECT THE COURSE OF YOUR INVESTIGATION.
5. COVER ANY SUSPECTED EVIDENCE IN COURSE OF FIGHTING THE FIRE.

III. ELEMENTS

A. FIRE (BURNING)

B. INCENDIARY IN ORIGIN

C. ACCUSED IS RESPONSIBLE FOR FIRE, PUT AT THE SCENE.

IV. CORPUS DELICTI

A. IN ORDER TO ESTABLISH THE CORPUS DELICTI IN AN ARSON CASE THE INVESTIGATOR MUST PROVE THAT THE FIRE WAS NOT CAUSED BY NATURAL OR ACCIDENTAL CAUSES, BUT WAS A SET FIRE, THAT IS, A FIRE OF INCENDIARY ORIGIN

IV. (CONTINUED)

B. CORPUS DELICTI - THE BODY OF THE CRIME - IN AN ARSON CASE THIS MEANS PROVING THE INCENDIARY ORIGIN OF THE FIRE. THERE IS NO PRESUMPTION THAT A BURNING BUILDING HAS BEEN INTENTIONALLY SET ON FIRE. ON THE CONTRARY, THE PRESUMPTION OF INNOCENCE WHICH BELONGS TO THE ACCUSED CARRIES WITH IT A PRESUMPTION THAT THE FIRE IS OF ACCIDENTAL OR PROVIDENTIAL ORIGIN. THUS, THE CORPUS DELICTI REQUIRES NOT ONLY THE BURNING OF THE BUILDING, BUT ALSO THAT THE BURNING WAS CAUSED BY A CRIMINAL AGENCY.

C. ACCEPTED METHODS OF PROVING THE INCENDIARY ORIGIN OF THE FIRE:

1. SEPARATE FIRES OR MULTIPLY FIRES.
2. INCENDIARY DEVICES
3. THE USE OF ACCELERANTS
4. PREPARATION FOR THE FIRE
5. UNUSUAL CIRCUMSTANCES, UNUSUAL BURNING
6. THE ABSENCE OF ALL OTHER CAUSES (EXPERTS CAN HELP ELIMINATE ELECTRICAL AND HEATING)
7. RELIABLE WITNESS TO CRIME
8. PAPERS OR COMBUSTIBLES ARRANGED FOR FIRE - MAYBE WITH CONNECTING TRAILERS.
9. HOLES BROKEN THROUGH FLOORS, WALLS AND CEILINGS, FOR FIRE TRAVEL
10. SECRET REMOVAL OF PROPERTY AND CONCEALING BEFORE UNEXPLAINED FIRE
11. OBSERVED TAKING COMBUSTIBLES OR AGENTS TO THE SCENE, OR UNUSUAL ACQUIRING OF SAME.
12. WITNESS INFORMING THAT SUSPECT TRIED TO HIRE JOB DONE
13. INQUIRES ABOUT OR OBTAINING INSURANCE (FRAUD FIRES)
14. SUSPECT AT MANY UNEXPLAINED FIRES

V. METHODICAL SEARCH OF FIRE SCENE

A. CHECK THE ENTIRE BUILDING (SOME SETS DO NOT TAKE)

B. SPECIAL ATTENTION TO POSSIBLE ACCIDENTAL CAUSES (MUST BE ABLE TO ELIMINATE)

C. POSSIBLE RECONSTRUCTION OF SCENE

D. FINGERPRINTS

E. TRACKING DOG

VI. EVIDENCE AND CONTAINERS, LABORATORY ANALYSIS

A. GASOLINE IS GENERALLY THE MOST READILY AVAILABLE FLAMMABLE LIQUID AND THIS LIQUID IS QUITE COMMONLY USED IN ARSON. GAS IS RELATIVELY VOLATILE AND WILL CREATE EXPLOSIVE CONDITIONS IN THE ENVIRONMENT RATHER RAPIDLY. HOPEFULLY THE ARSONIST WILL SET HIMSELF ON FIRE AND THIS DOES HAPPEN OCCASIONALLY.

1. PLASTIC CONTAINERS USED, WHAT TO LOOK FOR AT THE SCENE
2. FLAMMABLE LIQUID PATTERNS, SEEK LOWEST LEVELS, CRACKS AND CREVICES.
3. WATCH FOR ODORS
4. WAVY BURN PATTERN. WATER TENDS TO SEAL IN FLAMMABLE LIQUID
5. NARROW CHAR LINES IN SEAMS OF FLOORING
6. EXPLAIN HOW TO PICK UP EVIDENCE, CONTAIN THE VAPORS (RETAINED FOR LONG PERIODS OF TIME)
   (A) CHAIN OF EVIDENCE (CUSTODY) - MARK -
7. PHOTOGRAPHS BEFORE AND AFTER.
8. DIAGRAMS AND DRAWINGS (DRAFTSMAN, LARGE SCALE DRAWING)
9. DISPLAY EVIDENCE CONTAINERS, SEAL IN THE VAPORS.
10. LABORATORY ANALYSIS, GAS CHROMATOGRAPH, WHERE TO GET ANALYZED
11. MOLOTOV COCKTAILS, STRESS IMPORTANCE OF FINGERPRINTS IN ALL FIRE INVESTIGATIONS.

VI. (CONTINUED)

11. (CONTINUED)

(A) USING ALL OVER THE STATE (VIRGINIA BEACH)

(B) GAS AND WICK

(C) GAS - SOAP - NAPALM

(D) GAS AND SULFURIC ACID (MIXTURE OF SUGAR AND POTASSIUM CHLORATE)

(E) SCORE HAIR CREAM - CALCIUM HYPOCHLORITE

VII. PHOTOGRAPHS

A. A PHOTOGRAPH SHOULD DEPICT A TRUE REPRESENTATION OF THE SCENE

B. IT IDENTIFIES THE SCENE

C. SHOWS THE RELATIVE POSITIONS OF OBJECTS IN THE SCENE

D. EXTERIOR PHOTOGRAPHS SHOULD INCLUDE ALL SIDES; CLOSE-UPS WHEN NECESSARY

E. INTERIOR PHOTOGRAPHS

1. PHOTOGRAPH ALL ROOMS
2. PHOTOGRAPH OBJECTS IN THEIR ORIGINAL POSITION IF RELATED TO THE INCENDIARY NATURE OF THE FIRE.
3. PHOTOGRAPH ALL CONTENTS IN A BUILDING. MAY BE USEFUL FOR A LATER COMPARISION WITH THE INSURED'S INVENTORY.

VIII. PERSON RESPONSIBLE -PROOF OF GUILT.

A. WE MUST ALSO SHOW THAT A PERSON OR SUBJECT IS RESPONSIBLE.

MUST SHOW BY FACTS OR CIRCUMSTANCES, OR BOTH, THAT THE SUSPECT COULD AND DID SET THE FIRE IN QUESTION, OR IF HE PROCURED, AIDED, COUNSELED, (BEYOND A REASONABLE DOUBT)

MANY CASES WILL ESTABLISH AN ALIBI, LEAVE AREA BY PLANE, CHECK IN AT A MOTEL, USE OF MECHANICAL DEVICES, CLOCKS, CANDLES, ETC..

VIII. (CONTINUED)

A. (CONTINUED)

MUST PLACE THE SUBJECT OR SUSPECT AT THE SCENE OR COULD HAVE BEEN THERE WITH DELAYED ACTION, TIME ELEMENT OPPORTUNITY OR CONNECTION TO THE FIRE ORIGIN.

IF SUSPECT IS PLACED AT THE SCENE (POINT OF ORIGIN) AND CORPUS DELICTI IS ESTABLISHED, IT IS USUALLY NOT TOO HARD TO PROVE ARSON. PLACING THE SUSPECT AT THE SCENE IS IMPORTANT ONLY IF THE CORPUS DELICTI CAN BE ESTABLISHED.

MAJORITY OF ITEMS MENTIONED AS IMPORTANT FACTORS TO PROVE CORPUS DELICTI ARE ALSO IMPORTANT TO ESTABLISH PROOF OF GUILT - PREPONDERANCE OF CIRCUMSTANCES IS VALUABLE HERE ALSO.

IX. MOTIVE (REASON FOR SETTING THE FIRE)

A. NOT A LEGAL REQUIREMENT, BUT VERY ESSENTIAL IN MOST CASES. IS NOT AN ESSENTIAL ELEMENT.

B. THIS IS THE FACTOR THAT IS THE BASIS OR REASON FOR MOST ARSON INVESTIGATIONS. MOTIVE DIRECTS THE CAUSE OF THE INVESTIGATION, HELPS PRESENT THE CASE, SHOWS WHY THE DEFENDANT ACTED AS HE DID, WHAT HE HOPES TO GAIN BY THE FIRE. IS NO GOOD IF THIS IS THE ONLY FACTOR THAT CAN BE PROVED.

C. MOTIVE IS THE IMPULSE OR INTENTION THAT CAUSES A PERSON TO DO SOMETHING OR ACT IN A CERTAIN WAY. THE INDUCEMENT WHICH LEADS OR TEMPTS THE MIND TO COMMIT ARSON.

D. USE MOTIVE AS A GAUGE AS TO HOW FAR MAY CONDUCT AN INVESTIGATION.

IX. (CONTINUED)

E. GENERALLY CONSIDERED, HAVE 5 GENERAL CLASSIFICATIONS OF MOTIVES FOR ARSON.

1. ECONOMIC GAIN WHERE ASSURED BENEFITS DIRECTLY
   (A) FRAUD FIRE
2. ECONOMIC GAIN WHERE ASSURED IS AN INNOCENT PARTY, BUT THE PRERPETRATOR BENEFITS DIRECTLY OR INDIRECTLY.
   (A) COMPETITORS - TO STIFLE COMPETITION
   (B) SECURE EMPLOYMENT, WATCHMAN, FIREMAN, POLICEMAN.
3. PERSONAL SATISFACTION, ATTAINMENT OF A GOAL OR FURTHERANCE OF A CAUSE.
   (A) UNION FIRES
   (B) REVENGE, SPITE, GRUDGE
   (C) REJECTED GIRL FRIEND, MARITAL PROBLEMS.
4. CONCEALMENT OF A CRIME OR SOME CRIMINAL ACT
   (A) COVER UP STOCK SHORTAGE
   (B) DESTROY RECORDS SHOWING EMBEZZLEMENT.
   (C) MURDER, BREAKING AND ENTERING
5. ARSON BY MENTALLY AFFLICTED
   (A) PYRO

F. MOTIVE IS A GOOD PIECE OF CIRCUMSTANTIAL EVIDENCE WHICH WILL AID IN CONVICTING AN ARSONIST. DON'T CONFUSE MOTIVE WITH INTENT. INTENT IS AN ESSENTIAL ELEMENT AND MOTIVE IS NOT.

X. INTERVIEWS AND INTERROGATION

A. COMPLAINANT, MAY HAVE SET THE FIRE, COULD PINPOINT POINT OF ORIGIN

B. NEIGHBORS

C. FIREMAN

D. ALL WITNESS'S, HELP DETERMINE POINT OF ORIGIN

X. (CONTINUED)

E. INSURANCE PEOPLE, AGENTS AND ADJUSTER

1. ADVISE OF SUSPICIOUS FIRE - DON'T WANT THEM TO PAY CLAIM

F. INTERROGATION OF A SUSPECT IS PRIMARILY TO OBTAIN A CONFESSION OR ADMISSIONS OR INFORMATION TO ASSIST IN FORMING EVIDENCE FOR PROSECUTION.

INTERVIEW, OBTAIN INFORMATION, OBTAIN FACTS. EXAMINATION OF A SUSPECT BY QUESTIONING, ATTEMPTING TO GET THE TRUTH.

1. BE FAMILIAR WITH THE FACTS AND CIRCUMSTANCES OF THE CASE BEFORE YOU START, DON'T JUST GO ON A FISHING EXPEDITION.
2. FEEL IS INVOLVED, ACCUSE, HEARD IT SAID OFFICER NEVER ASKED IF I WAS INVOLVED.
3. SYMPATHIZE WITH SUBJECT, ESPECIALLY WITH A PYRO, KINDNESS, SAME AS IN A SEX CRIME.
4. DON'T ASK TO TAKE POLYGRAPH ON THE FIRST QUESTION, INTERROGATE AND AS A LAST RESORT ASK IF HE WILL TAKE A POLYGRAPH.
5. CONFESSION IS NO GOOD WITHOUT CORPUS DELICTI.
6. NEVER BEEN TURNED DOWN ON A WARRANT FOR ARSON WHERE HAVE HAD A CONFESSION.

XI. POLYGRAPH

A. GOOD INVESTIGATIVE AID, USE A LOT IN ARSON INVESTIGATION.

XII. SUSPICIOUS FATAL FIRES

A. SUSPECT FOUL PLAY, REQUEST AN AUTOPSY (OAKLAND COUNTY CASE)

B. SOOT IN WINDPIPE - CARBON MONOXIDE IN THE BLOOD.

XII. (CONTINUED)

C. BODY IS STARVED FOR OXYGEN, CARBON MONOXIDE HAS REPLACED THE OXYGEN IN THE BLOOD. MUST COME THROUGH BREATHING. HAD TO BE LIVING AT THE TIME OF THE FIRE.

ABSENCE OF CARBON MONOXIDE INDICATES WAS DEAD BEFORE THE FIRE, COULD BE A HEART ATTACK, AUTOPSY WILL REVEAL THIS.

GET BLOOD IF NOTHING ELSE, STATE WANT IT CHECKED FOR CARBON MONOXIDE AND ALCOHOL CONTENT. MAKE SURE IT IS TAKEN BEFORE BODY IS EMBALMED.

XIII. PROSECUTOR

A. SHOULD HAVE A POSITIVE ATTITUDE WHEN YOU SEE THE PROSECUTOR FOR A WARRANT. IMPRESS ON HIM THAT YOU WANT THIS WARRANT, "DON'T DEMAND". SHOW A DETERMINED INTEREST, DON'T GO IN WITH A NEGATIVE ATTITUDE.

QUOTE CASE - "THERE SHE IS, YOUR BABY NOW, I'VE DONE MY JOB".

IF HE ASKS YOU, TELL HIM WHAT YOU WANT, MIGHT SAY WHAT DO YOU THINK, SEEN FELLOWS HESITATE, AND SAY IT'S UP TO YOU. IF YOU HAVE NO DEFINITE INTEREST, HE SURE WON'T SHOW ANY INTEREST.

SIT DOWN WITH THE PROSECUTOR, HERE'S WHAT I HAVE, GO OVER THE CASE POINT BY BOINT, GO INTO HEATING UNITS, ELECTRICAL, SHOW CAN ELIMINATE ACCIDENTAL CAUSES, MAY HAVE DEFINITE SETS IN THE BUILDING, DISCUSS THE EVIDENCE, LABORATORY REPORTS, PHOTOGRAPHS, CONFESSION, ETC. REMEMBER HE HAS TO RELY ON YOUR TESTIMONY AND EVIDENCE WHEN YOU GET IN COURT.

XIII (CONTINUED)

B. BE PREPARED TO ASSIST THE PROSECUTOR AT THE TRAIL. ADVISE HIM WHAT THE WITNESS'S CAN TESTIFY TO, POINTS HE SHOULD BRING OUT. HAVE A PAD, WRITE DOWN QUESTIONS YOU THINK MAY BE OF VALUE AND ASSIST HIM IN THE CASE, REMEMBER THEY DON'T GET TOO MANY ARSON CASES.

C. IN TESTIFYING, NO CRIME TO SAY, "DON'T KNOW", DON'T GUESS, GET IN A JAM. IF YOU DON'T KNOW, SAY SO. TELL WITNESS'S TO TELL THE TRUTH. (BAD AXE CASE)

O.K. TO TAKE NOTES ON THE WITNESS STAND, BETTER TO DO THIS THAN GUESS AND TESTIFY WRONG. DEFENSE ATTORNEY CATCH YOU IN ONE WRONG STATEMENT, MAKE A BIG ISSUE OUT OF IT BEFORE THE JURY, CREATE A DOUBT, COULD COST YOU THE CASE.

REMEMBER, DON'T BE AFRAID OF AN ATTORNEY, A GOOD ATTORNEY IS MORE APT TO BE AFRAID OF A GOOD POLICEMAN OR FIREMAN, ESPECIALLY IN AN ARSON CASE. THEY DON'T GET TOO MANY, DON'T KNOW A LOT OF THE TECHNICAL ANSWERS AND A WRONG QUESTION TO A FIRE EXPERT, COULD BE A FATAL MISTAKE.

IX. SUMMARY

A. PROTECTION OF THE FIRE SCENE

B. SECURITY OF THE BUILDING

C. ELEMENTS

D. CORPUS DELICTI

E. METHODICAL SEARCH OF THE SCENE

F. EVIDENCE, CONTAINERS AND LABORATORY ANALYSIS

G. PHOTOGRAPHS

H. MOTIVES

I. INTERVIEWS AND INTERROGATION

IX. (CONTINUED)

J. POLYGRAPH

K. FATAL FIRES

L. PROSECUTION

M. THERE IS A LOT OF ARSON GOING UNDETECTED, JUST SCRATCHING THE SURFACE OF THIS IMPORTANT FIELD OF INVESTIGATION. IF EVERY FIRE SETTER WOULD ANTICIPATE RELENTLESS INVESTIGATION AND PROSECUTION, ARSON IN THE STATE WOULD DECREASE.

THANK YOU FOR YOUR ATTENTION

[redacted]

INSTRUCTIONS FOR USE

DONNING AND CHECKING THE APPARATUS

1. Before donning the SURVIVAIR check to make sure the high pressure hose is securely attached to the regulator and cylinder valve. Tighten by hand.

2. Check to see that the swing bolt on the pac is secured to the cylinder band.

3. Place the right arm and shoulder through the right shoulder strap. Rest the pac on the right shoulder and place the left arm through the left shoulder strap similar to donning a coat.

4. Bend the body slightly forward from the waist and pull the under-arm adjustment straps until the BACK SUPPORT STRAP rests in the small of the back.

NOTE: Proper positioning of the support strap will distribute the apparatus weight OVER the hips rather than the shoulders. To adjust shoulder straps press adjustment buckles and tighten webbing to desired position.

5. Adjust waist belt slide so that the spring snap on the regulator support belt can be clipped to the slide. Tighten belt by pulling webbing through slide. The belt should be tightened so that regulator rests FIRMLY high against the user's waist.

6. Make sure the reserve lever is in the START position.

7. Check the main-line valve. It should be OPEN and LOCKED in position. (Rotated fully counter-clockwise). Check the by-pass valve. It should be CLOSED. (Rotated fully clockwise).

8. Open cylinder valve completely and check pressure reading on regulator gauge. A full cylinder should indicate approximately 2216 PSI (2015 + 10% at 70 deg. F.). On opening the valve a clicking noise indicates the valve is being turned on. When open it is automatically locked to prevent accidental closure.

NOTE: To close, push the locking sleeve inward and rotate counter-clockwise. The handle will now rotate freely to the closed position. To reset the locking mechanism, rotate the sleeve clockwise after closing the valve.

9. Place neck strap of mask over the neck and rest the mask on the chest. Adjust all head harness straps fully out. Pull headstrap assembly over the head and extend the FULL length down the back of the neck. Place chin against chin guide. Tighten chin straps, then temple, and forehead. Tighten comfortably tight. To check mask seal, place a thumb in the hose inlet and inhale. The mask should collapse to the face and remain collapsed while the breath is held. If leakage occurs, readjust facepiece and repeat test. Test exhalation valve by exhaling with the hose still closed off.

NOTE: To conserve air, do not connect the mask hose to the regulator until ready to enter the contaminated area. If fog develops on the lens while testing mask seal, flush lens with by-pass air after connecting hose to regulator.

10. Remove dust cap from regulator outlet. Place hose coupling on regulator outlet and tighten. Inhale and exhale to check demand valve operation.

NOTE: If the mask hose is removed quickly from the regulator outlet during inhalation a steady flow of air MAY occur. To stop, cover the regulator outlet momentarily with the hand.

OPERATING INFORMATION

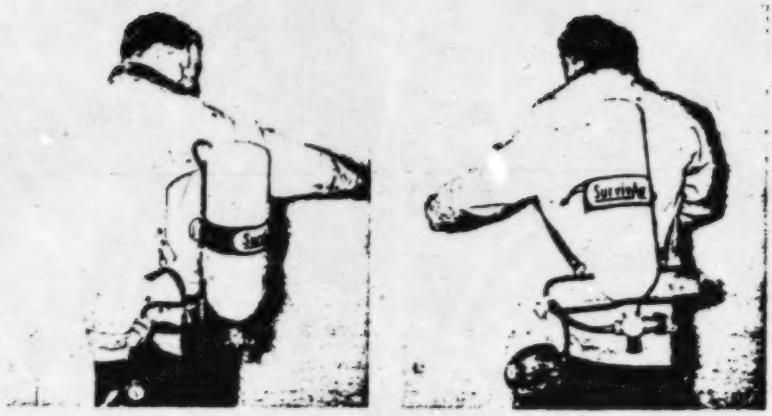
1. The SURVIVAIR regulator incorporates a LOW-AIR WARNING DEVICE which starts to restrict the air flow at approximately 450 PSI cylinder pressure. This causes a POSITIVE physical warning that air pressure is low. When the restriction occurs, pull the reserve lever from the START to the RESERVE position. Normal flows are returned and a known duration of 5 to 6 minutes reserve air is assured the user for returning to fresh air.

2. During normal demand operation the main-line valve should be fully open, and the by-pass control valve should be closed. If the automatic demand regulator becomes inoperative so that NO air passes through the regulator, the emergency by-pass valve (RED KNOB) should be OPENED by turning counter-clockwise. This will provide a CONTINUOUS flow of air to the mask "by-passing" the demand regulator mechanism. The flow can be adjusted to suit the user's requirements. The wearer should then return promptly to fresh air. If a failure or damage to the demand valve causes a CONTINUOUS flow through the regulator, the emergency by-pass valve should FIRST be OPENED, and then the main-line valve CLOSED to prevent excess leakage of air.

NOTE: During normal demand operations DO NOT use the by-pass valve. It is not necessary, and the air supply will be used much faster than during demand operations.

SWING ON METHOD

Make sure regulator and slide buckle are spread to the side. Place right arm through shoulder strap until strap rests on shoulder. Place left arm inside left strap and swing Bac-Pac into position. Place left hand on left shoulder strap and guide strap evenly over shoulder.



OVERHEAD METHOD

Spread regulator and slide buckle to the side of Bac-Pac. Place hands on cylinder as illustrated and slowly lift unit over the head. Guide Bac-Pac over the shoulders and release.

After completing either of the above methods, proceed with the following:

Bend body forward at waist and position back support strap as illustrated. Adjust shoulder buckles for preferred tightness. Hook regulator snap onto slide buckle and tighten regulator firmly on waist.

For standby position place the mask neck strap over head, and rest mask on chest.

Always check mask and hose for seal. Open cylinder valve and connect hose coupling to regulator outlet. Note: When donning mask pull head strap fully down toward neck. Place chin in chin rest, comfortably tighten neck straps, then temple and forehead.

HOSPITAL AND NURSING HOME

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This outline is provided since the entire outline is too large to add to the report.

These questions were prepared to gauge your performance and material. Please explain before requesting men to answer question sheet for you.

1. Did instructor explain purpose of the course?

2. Was your curiosity and attention aroused enough to want to learn?

3. Rate presentation --

   Fair Good Excellent

4. Rate subject matter --

   Fair Good Excellent

5. Were you motivated so as to look forward to the next class?

6. Will you suggest how the program could be improved?

7. Would more student participation help the course?

8. Rate instructor's efforts --

Information:	increase	decrease
Visual Aids:	adequate	inadequate
Student Participation:	increase	decrease
Performance Tests:	increase	decrease